UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

October 18, 2002

Ms. Shannon C. Stewart
Environmental Specialist
Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

Re: Endangered Species Act and Essential Fish Habitat Consultations: Biological Assessment for the L6-to-S14 Water Transfer Project, Lemhi River and Salmon River, Idaho (One Project)

Dear Ms. Stewart:

Enclosed is the biological opinion prepared by the National Marine Fisheries Service (NOAA Fisheries) on the L6-to-S14 Water Transfer Project. The enclosed document represents NOAA Fisheries' biological opinion on the effects of the proposed action on listed species and designated critical habitat in accordance with Section 7 of the Endangered Species Act of 1973 as amended (16 USC 1531 *et seq*.).

In this biological opinion, NOAA Fisheries has determined the proposed action is not likely to jeopardize the continued existence of Snake River spring/summer chinook salmon, Snake River steelhead, or Snake River sockeye salmon. NOAA Fisheries has also determined the proposed action is not likely to result in the destruction or adverse modification of critical habitat for Snake River chinook salmon or Snake River sockeye salmon. A complete administrative record of this consultation is on file with NOAA Fisheries' Habitat Conservation Division in Boise, Idaho.

In addition to the biological opinion, enclosed as section III, is a consultation regarding Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267). NOAA Fisheries finds the proposed action may adversely affect EFH for Snake River chinook salmon.

Dr. Jim Morrow (208) 378-5695, and Mr. Don Anderson (208) 378-5792 are the NOAA Fisheries contacts for this consultation.

Sincerely,

For Michael R Crouse

D. Robert Lohn
Regional Administrator

Enclosure

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Endangered Species Act Section 7 Consultation Biological Opinion
and
Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

L6 to S14 Water Transfer Project
Lemhi and Salmon Rivers
Lemhi County, Idaho

Agency: Bonneville Power Administration

Consultation Conducted By: National Marine Fisheries Service (NOAA Fisheries)
Northwest Region

Date Issued: 10/18/2002

Issued by: for Michael R Crouse

D. Robert Lohn
Regional Administrator

Refer to: F/NWR/2002/01228

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. INTRODUCTION

The Bonneville Power Administration (BPA) proposes modifying existing irrigation infrastructure to allow irrigators currently using water diverted from the Lemhi River, to irrigate their lands with water diverted from the Salmon River, thus allowing 13.5 cubic feet per second (cfs) of water to be permanently transferred to an instream flow water right in the Lemhi River. The purpose of the proposed project is to improve instream flows in the lower Lemhi River. The BPA is proposing the action in accordance with its authority under the Pacific Northwest Electric Power Planning and Conservation Act of 1980. The Bureau of Reclamation (BOR) and the Natural Resources Conservation Service are providing technical assistance for this project.

A. Background

Surface water diversions for irrigation and other uses have interrupted connectivity of the Lemhi River to the Salmon River. During years with low to average water availability, surface water diversions in the lower 8.3 miles of the Lemhi River inhibit both upstream and downstream migration of adult and juvenile Snake River spring/summer salmon and Snake River steelhead (IDFG 2001). Insufficient streamflows due to irrigation diversions have contributed to the decline of anadromous salmonids in the Lemhi River subbasin.

In the 1994 Environmental Report for the Water Conservation Demonstration Project (BOR 1994) six diversions were proposed for reconstruction on the Lemhi River between River miles (RM) 5.5 to 8.3 to improve upstream and downstream passage for Snake River spring/summer chinook salmon and Snake River steelhead. The L6 diversion, at RM 8.3, was reconstructed as part of this project, resulting in a permanent diversion dam with an automated headgate, a fish screen, a juvenile bypass system, and a fish ladder adjustable for different water levels.

In December of 2000, National Marine Fisheries Service (NOAA Fisheries) issued the Biological Opinion on the "Reinitiation of Consultation on Operation of the Federal Columbia River Power System, Including the Juvenile Fish Transportation Program, and 19 Bureau of Reclamation Projects in the Columbia Basin" (FCRPS Opinion) (NMFS 2000). The Reasonable and Prudent Alternatives (RPA) in the FCRPS Opinion included 199 actions to ensure high likelihood of conserving listed anadromous fishes. Action 149 in the RPA states that the BOR:

> "shall initiate programs in three priority subbasins (identified in the Basinwide Recovery Strategy) per year over 5 years, in coordination with NOAA Fisheries, FWS (U.S. Fish and Wildlife Service), the states, and others, to address all flow, passage, and screening problems in each subbasin over 10 years . . . This action initiates immediate work in three such subbasins per year, beginning in the first year with the Lemhi, Upper John Day, and Methow subbasins."

The BOR responded by drafting "Evaluations of Six Priority Subbasins for the Implementation of 1-Year Plans in Fiscal Year 2002" (BOR 2001), in which the Lemhi subbasin and the Upper Salmon subbasin (defined as the Salmon River drainage upstream from the confluence of the Salmon and Pahsimeroi Rivers) were addressed. In the Lemhi subbasin, the reach immediately below the L6 diversion was identified as a fish passage problem during low flow periods.

During the early spring of 2000, instream flow at the L6 diversion, including flow through the fish ladder and juvenile bypass system, was completely shut off blocking upstream and downstream migration and causing mortality of Endangered Species Act (ESA) listed fishes between the L6 diversion and the mouth of the Lemhi. Ensuing negotiations resulted in the Idaho Legislature establishing an instream flow water right in the lower Lemhi River. This instream flow water right differed from others in the state in that senior water rights could be transferred to instream flow and retain their original priority dates. The L6-S14 Water Transfer is the first project that would permanently transfer senior water rights to the Legislatively established instream flow water right.

The objective of this biological opinion is to determine whether the L6-S14 Water Transfer Project is likely to jeopardize the continued existence of the Snake River spring/summer chinook salmon, Snake River sockeye salmon, and Snake River steelhead; result in the destruction or adverse modification of critical habitat for chinook salmon; or adversely affect Essential Fish Habitat (EFH) for chinook salmon. The BPA initiated consultation on the L6-S14 Water Transfer Project in a letter dated October 7, 2002, received by NMFS on October 9, 2002. The BPA also provided a biological assessment (BA) for the proposed action dated October 7, 2002.

B. Description of the Proposed Action

Proposed actions are defined by NOAA Fisheries regulations (50 CFR 402.02) as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." Because the BPA will fund the action, a Federal nexus exists for interagency consultation under ESA section 7(a)(2). The proposed actions are in or adjacent to the S14 and L6 ditches, on lands between the S14 and L6 ditches, and on ranches currently irrigated with Lemhi River water from the L6 ditch. The project will affect flows in the Lemhi River and the mainstem Salmon River and could affect anadromous fish stocks in the Lemhi River subbasin and in the Upper Salmon, Middle Salmon-Panther, and Pahsimeroi subbasins (Upper Salmon Subbasins). These areas are occupied by Snake River spring/summer chinook salmon, Snake River sockeye salmon, and Snake River steelhead. All stream reaches that would be affected have been designated as critical habitat for Snake River spring/summer chinook salmon. The portion of the Salmon River that would be affected by the project has been designated as critical habitat for Snake River sockeye salmon (50 CFR 226.205).

1. Modification of Water Delivery Systems

The proposed action would modify the water delivery system associated with the S14 diversion on the Salmon River (RM 264) so that lands currently irrigated with water diverted from the Lemhi River could be irrigated with water diverted from the Salmon River. This would involve: construction of a pumping plant; increasing capacity of approximately 3 miles of the Pope Ditch (which serves existing S14 costumers) by 15 cfs; and construction of 2.5 miles of new buried pipeline (6 inches to 2 feet in diameter) from the new pumping plant to the properties of the Lemhi River irrigators participating in the project. The new pumping plant would be located just north of the Salmon Airport. Its purpose would be to convey water from the upgraded S14 canal to agricultural fields currently irrigated from the L6 diversion via the existing L6 canal. Much of the new pipeline connecting the pumping plant to the fields of the participating irrigators will be placed within the right-of-way of the existing L6 canal, although some of its length will also be placed adjacent to existing roads and will require new trenching. Irrigation turnouts on the refurbished Pope Ditch and the new pipeline will consist of 6 feet by 6 feet concrete structures with metal gates and water flow measurement devices.

Total volume of water diverted at the S14 diversion would increase from 39 to 53 cfs. This would be accomplished by transferring 13.5 cfs of water rights currently diverted at the L6 diversion to the Lemhi River instream flow water right described in section A. This would reduce the total volume of water diverted at the L6 diversion from 42.6 to 29.1 cfs and would increase flows in the lower 8.3 miles of the Lemhi River by 13.5 cfs anytime Water District 74 is in regulation. Conveyance loss in the proposed system will probably be slightly less than in the current system. This water may be available for irrigation use, however, the amount of such water availability increase is not known.

This portion of the proposed project would affect anadromous fish stocks in the Lemhi subbasin and in the Upper Salmon Subbasins.

2. Repairs to the S14 Diversion

A section, approximately 100 feet long, of the embankment separating the S14 diversion ditch from the Salmon River will be repaired. This will involve reconstruction of the embankment above the normal high water level, and replacement of riprap above and below the normal high water level along the Salmon River.

The conservation measure identified by BPA was:

- In-channel work will take place from November 1 to December 31.

3. On Farm Improvements

Irrigation systems on lands serviced by the new system will be upgraded to improve irrigation efficiency. Water saved through increased irrigation efficiency may be available for irrigation use. The amount of water availability increase is not known.

II. ENDANGERED SPECIES ACT

The ESA of 1973 (16 USC 1531-1544), as amended, establishes a national program for the conservation of threatened and endangered species of fish, wildlife, and plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with FWS and NOAA Fisheries, as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or to adversely modify or destroy their designated critical habitats. This biological opinion (Opinion) is the product of an interagency consultation pursuant to section 7(a)(2) of the ESA and implementing regulations found at
50 CFR 402.

A. Biological Opinion

The objective of this Opinion is to determine whether the L6-S14 Water Transfer Project is likely to jeopardize the continued existence of Snake River spring/summer chinook salmon, Snake River sockeye salmon, or Snake River steelhead; or result in the destruction or adverse modification of designated critical habitat for Snake River spring/summer chinook salmon and Snake River sockeye salmon.

1. Action Area

An action area is defined by NOAA Fisheries regulations (50 CFR Part 402) as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.” The proposed project would affect flows in the lower 8.3 miles of the Lemhi River and in the Salmon River, below the S14 diversion (RM 264). The affected area serves as a migration corridor for adult and juvenile Snake River spring/summer chinook salmon, Snake River sockeye salmon, and Snake River steelhead migrating to and from spawning and rearing habitat in the Lemhi subbasin and the Upper Salmon Subbasins. The area also serves as rearing habitat for juvenile Snake River spring/summer chinook salmon and Snake River steelhead.

2. Biological Information and Critical Habitat

The proposed action may affect the ESA-listed species and designated critical habitat identified below in Table 1. The entire action area is designated critical habitat for Snake River spring/summer chinook salmon. Designated critical habitat for Snake River sockeye salmon, in the action area, includes only the mainstem Salmon River and adjacent riparian habitat. Based on life history timing for these evolutionary significant units (ESUs), it is likely that incubating eggs, juveniles, smolts, and adult life stages of these listed species would be affected by the proposed action.

Essential features of critical habitat for the listed species are: (1) Substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food (juvenile only), (8) riparian vegetation, (9) space, and (10) safe passage conditions. The project activities are likely to affect the following essential features: water quality, water quantity, water velocity, and safe passage conditions.

Table 1. - References for Additional Background on Listing Status, Biological Information, Protective Regulations, and Critical Habitat Elements for the ESA-Listed and Candidate Species Considered in this Consultation.

Species ESU	**Status**	**Critical Habitat**	**Protective Regulations**
Snake River spring/summer chinook salmon (*Oncorhynchus tshawytscha*)	April 22, 1992; 57 FR 14653, Threatened	October 25, 1999; 64 FR 57399[1]	July 10, 2000; 65 FR 42422
Snake River sockeye salmon (*O. nerka*)	November 20, 1991; 56 FR 58619, Endangered	December 28, 1993; 58 FR 68543	ESA section 9 applies
Snake River steelhead (*O. mykiss*)	August 18, 1997; 62 FR 43937, Threatened	February 16, 2000; 65 FR 7764; remanded April 30, 2002	July 10, 2000; 65 FR 42422

[1] This corrects the original designation of December 28, 1993 (58 FR 68543) by excluding areas above Napias Creek Falls, a naturally impassable barrier.

a. Snake River Spring/Summer Chinook

The Snake River spring/summer chinook salmon ESU, listed as threatened on April 22, 1992 (67 FR 14653), includes all natural-origin populations in the Tucannon, Grande Ronde, Imnaha, and Salmon Rivers. Some or all of the fish returning to the Tucannon River, Imnaha, Grande

Ronde, Sawtooth, Pahsimeroi, and McCall hatcheries are also listed. Although Snake River spring/summer chinook salmon are listed as threatened, the population was very near the endangered threshold at the time of listing (Matthews and Waples 1991) and dropped below the endangered threshold for several years in the mid 1990s (Fish Passage Center 2001b).

For the Snake River spring/summer chinook salmon ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period[1] ranges from 0.96 to 0.80, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to the effectiveness of fish of wild origin (Tables B-2a and B-2b in McClure et al 2000). NOAA Fisheries has also estimated median population growth rates and the risk of absolute extinction for the seven spring/summer chinook salmon index stocks,[2] using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not reproduced (i.e., hatchery effectiveness = 0), the risk of absolute extinction within 100 years for the wild component ranges from zero for Johnson Creek to 0.78 for the Imnaha River (Table B-5 in McClure et al 2000). At the high end, assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100%), the risk of absolute extinction within 100 years ranges from zero for Johnson Creek to 1.00 for the wild component in the Imnaha River (Table B-6 in McClure et al. 2000).

The Snake River drainage is believed to have produced more than 1.5 million adult spring/summer chinook salmon in some years during the late 1800s (Matthews and Waples 1991). By the 1950s, the abundance of spring/summer chinook salmon had declined to an annual average of 125,000 adults. Adult returns counted at Lower Granite Dam reached all-time lows in the mid-1990s (Less than 8,000 adult returns, natural and hatchery), but numbers have increased somewhat since 1997. Habitat problems are common in the range of this ESU. Spawning and rearing habitats are often impaired by activities such as tilling, water withdrawals, timber harvest, grazing, mining, and alteration of floodplains and riparian vegetation. Mainstem Columbia River and Snake River hydroelectric developments have altered flow regimes and estuarine habitat and disrupted migration corridors. Competition between natural indigenous stocks of spring/summer chinook salmon and spring/summer chinook salmon of hatchery origin has likely increased due to an increasing proportion of naturally-reproducing fish of hatchery origin.

Compared to the greatly reduced numbers of returning adults during the 1980s and 1990s, numbers of adult chinook salmon returning to the Snake River drainage in 2000 and in 2001 were large. These large returns are thought to be a result of favorable ocean conditions and

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[1] Estimates of median population growth rate, risk of extinction, and the likelihood of meeting recovery goals are based on population trends observed during a base period beginning in 1980 and including 1999 adult returns. Population trends are projected under the assumption that all conditions will stay the same into the future.

[2] McClure et al. (2000a) have calculated population trend parameters for additional SR spring/summer chinook salmon stocks.

above average flows in the Columbia River Basin when the smolts migrated downstream. However, the 2000 and 2001 runs are only a fraction of the size of runs in the late 1800s. The 2002 run was also large compared to runs in the late 1990s but the 2003 and 2004 runs are expected to be poor due to low flows when smolts were migrating in 2000 and 2001. The long term decline in Snake River spring/summer chinook salmon is expected to continue for the foreseeable future. Detailed information on the current range-wide status of Snake River chinook salmon under the environmental baseline, is described in chinook salmon status review (Myers et al 1998).

Returns of wild Snake River spring/summer chinook salmon in the Lemhi subbasin and in the Upper Salmon Subbasins in 2000 and 2001 were comparable to runs in the late 1970s, considerably smaller than those of the 1960s and 1970s, and were a fraction of those in the late 1800s (Appendix A). Historically, Snake River spring/summer chinook salmon in the Lemhi subbasin probably used the entire mainstem Lemhi River and portions of Wimpey Creek, Big Timber Creek, Hayden Creek, and Big Springs Creek for spawning and rearing (McIntosh et al 1990). Hydropower plants began operating near the mouth of the Lemhi River in 1897 and continued until 1950 (Furness 1989). Migrating anadromous fishes could get over the power dams only during high flows in spring, and the run was nearly extirpated. The Snake River spring/summer chinook salmon run began to recover after the last hydropower plant went out of operation in 1950 (Gebhards 1959). Redd counts peaked in 1962 at 1,489 redds and then declined to 5 redds in 1995 (Appendix A). There has been a steady increase in redd counts since 1995 but the trend is not expected to continue into 2003 and 2004. Currently, Snake River spring/summer chinook salmon in the Lemhi River spawn in the upper reaches of the mainstem and in portions of Hayden Creek in some years (StreamNet).

b. Snake River Steelhead

The Snake River steelhead ESU includes all natural-origin populations of steelhead in the Snake River basin. None of the hatchery stocks in the Snake River basin are listed, but several are included in the ESU. Designated critical habitat for Snake River steelhead was administratively withdrawn on April 30, 2002. There is currently no designated critical habitat for Snake River steelhead.

For the Snake River steelhead ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period[3] ranges from 0.91 to 0.70, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure et al. 2000). NOAA Fisheries has also estimated the risk of absolute extinction for the A- and B-runs, using the same range of assumptions about the

[3] Estimates of median population growth rate, risk of extinction, and the likelihood of meeting recovery goals are based on population trends observed during a base period beginning in 1980 and including 1997 adult returns. Population trends are projected under the assumption that all conditions will stay the same into the future.

relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not reproduced (i.e., hatchery effectiveness = 0), the risk of absolute extinction within 100 years is 0.01 for A-run steelhead and 0.93 for B-run fish (Table B-5 in McClure et al. 2000). At the high end, assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100%), the risk of absolute extinction within 100 years is 1.00 for both runs (Table B-6 in McClure et al. 2000).

In listing the Snake River steelhead as threatened, NOAA Fisheries determined that the ESU is not presently in danger of extinction, but is likely to become endangered in the foreseeable future. This is due largely to the declining abundance of natural runs over the past decades. Some of the significant factors in the declining populations are mortality associated with the dams along the Columbia and Snake Rivers, losses from harvest, loss of access to more than 50% of their historic range, and degradation of habitats used for spawning and rearing. Possible genetic introgression from hatchery stocks is another threat to Snake River steelhead since wild fish comprise such a small proportion of the population. Additional information on the biology, status, and habitat elements for Snake River steelhead are described in Busby et al (1996).

The 2000 and 2001 counts at Lower Granite Dam indicate a short-term increase in returning adult spawners. Adult returns (hatchery and natural origin) in 2001 were the highest in 25 years and 2000 counts were the sixth highest on record (Fish Passage Center 2001b). Increased levels of adult returns are likely a result of favorable ocean and instream flow conditions for these cohorts. Although steelhead numbers have dramatically increased, wild steelhead comprised only 10% to 20% of the total returns since 1994. Consequently, the large increase in fish numbers does not necessarily reflect a change in steelhead status based on historic levels. Recent increases in the population are not expected to continue, and the long-term trend for this species indicates a decline.

Survival of downstream migrants in 2001 was the lowest since 1993. Low survival was due to record low run-off volume and elimination of spills from the Snake River dams to meet hydropower demands (Fish Passage Center, 2001a). Average downstream travel times for steelhead nearly doubled and were among the highest observed since recording began in 1996. Consequently, wide fluctuations in population numbers are expected over the next few years when adults return to spawning areas. In the Lemhi subbasin, presence of Snake River steelhead has been confirmed only in the mainstem Lemhi River, Hayden Creek, and Big Springs Creek, however, because steelhead spawn in the early spring during high water, they could be present in some of the creeks that are seasonally connected to the mainstem Lemhi River. Naturally produced Snake River steelhead occur in all the Upper Salmon Subbasins but detailed knowledge of spawning reaches and numbers of spawners is lacking. Detailed information on the current range-wide status of Snake River steelhead, under the environmental baseline, is described in steelhead status review (Busby et al 1996), and status review update (BRT 1998) *c. Snake River Sockeye Salmon*

The Snake River sockeye salmon ESU includes populations of sockeye salmon from the Snake River basin, Idaho (extant populations occur only in the Salmon River drainage). Under NOAA Fisheries' interim policy on artificial propagation (58 FR 17573), the progeny of fish from a listed population that are propagated artificially are considered part of the listed species and are protected under ESA. Thus, although not specifically designated in the 1991 listing, Snake River sockeye salmon produced in the captive broodstock program are included in the listed ESU. Given the dire status of the wild population under any criteria (16 wild and 264 hatchery-produced adult sockeye returned to the Stanley basin between 1990 and 2000), NOAA Fisheries considers the captive broodstock and its progeny essential for recovery.

Adult snake River sockeye salmon enter the Columbia River in late spring and early summer and reach the spawning lakes in late summer and early fall. The entire mainstem Salmon River downstream from Alturas Lake Creek has been designated as critical habitat for sockeye salmon (50 CFR Part 226, December 28, 1993), but all spawning and rearing habitat is in the Upper Salmon subbasin.

Snake River sockeye salmon stocks in Pettit, Stanley, and Yellow Belly Lakes were eliminated by a combination of fishery management practices designed to eliminate non-sport fishes, land use practices such as irrigation diversion, and migration blockage due to the Sunbeam Dam (Chapman et al 1990). Fishery management practices and the Sunbeam Dam are no longer adversely impacting Snake River sockeye salmon, however they have been and continue to be adversely impacted by operation of the FCRPS (Chapman et al 1990), and by low flows which are exacerbated by operation of irrigation diversions (Chapman et al 1990; Appendix B).

3. Evaluating the Proposed Action

The standards for determining jeopardy and adverse modification of critical habitat are set forth in section 7(a)(2) of the ESA and 50 CFR 402.02. In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps which are derived from the consultation regulations and the Habitat Approach (NMFS,1999): (1) Consider the status and biological requirements of the species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species; (4) consider cumulative effects; and (5) determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of species survival in the wild or adversely modify its critical habitat. In completing this final step of the analysis, NOAA Fisheries determines whether the action under consultation, together with all cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species or result in the destruction or adverse modification of designated critical habitat. If either or both are found, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

Recovery planning will help identify feasible measures that are important in each stage of the salmonid life cycle for conservation and survival within a reasonable time. In the absence of a final recovery plan, NOAA Fisheries must ascribe the appropriate significance of actions to the extent available information allows. NOAA Fisheries intends that recovery planning identifies areas/populations that are most critical to species conservation and recovery from which proposed actions can be evaluated for consistency under section 7(a)(2).

a. Biological Requirements in the Action Area

The first step NOAA Fisheries uses when applying the ESA section 7(a)(2) to the listed ESUs considered in this Opinion is to define the species' biological requirements within the action area. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species within the action area, NOAA Fisheries starts with the determinations made in its decision to list, for ESA protection, the ESUs considered in this Opinion and also considers any new data that is relevant to the determination.

Relevant biological requirements are those necessary for the listed ESU's to survive and recover to naturally reproducing population sizes at which protection under the ESA would become unnecessary. This will occur when populations are large enough to safeguard the genetic diversity of the listed ESUs, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment. Interim abundance targets developed by the Interior Columbia Technical Recovery Team are identified in Table 2 (NMFS 2002a). For this consultation, the relevant biological requirements are, water quality, water quantity, water velocity, safe passage conditions, and riparian habitat that function to support successful adult and juvenile migration, adult holding, spawning, incubation, rearing, and growth and development to adulthood.

Table 2. - Interim abundance targets for spawning aggregations in the Lemhi and Upper Salmon Subbasins of the Snake River spring/summer chinook salmon, Snake River sockeye salmon, and Snake River steelhead ESUs (NMFS 2002).

Spawning Aggregation	**Target Number of Spawners**
Spring/summer chinook salmon, Lemhi River	2,200
Spring/summer chinook salmon, Pahsimeroi River	1,500
Spring/summer chinook salmon, Salmon River, Lemhi To Redfish Lake Creek (summer)	2,000
Spring/summer chinook salmon, Salmon River, Lemhi to Yankee Fork (spring)	2,400
Spring/summer chinook salmon, Upper East Fork Salmon River (spring)	700
Spring/summer chinook salmon, Salmon River and tributaries above the Yankee Fork (spring)	5,100
Snake River sockeye salmon, entire ESU	1,500 in at least two lakes
Snake River steelhead, Lemhi River	1,600
Snake River steelhead, Pahsimeroi River	800
Snake River steelhead, upper Salmon River	4,700

b. Environmental Baseline

The environmental baseline includes "the past and present impacts of all Federal, state, or private actions and other human activities in the action area, including the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation and the impacts of state and private actions that are contemporaneous with the consultation in progress" (50 CFR 402.02). Step two of NOAA Fisheries' evaluation of jeopardy/adverse modification of critical habitat evaluates the relevance of the environmental baseline in the action area as it relates to the species' current status.

In describing the environmental baseline, NOAA Fisheries emphasizes essential elements of designated critical habitat or habitat indicators for the listed salmonid ESUs affected by the proposed action.

The Lemhi River is a low gradient spring-fed system. Human caused changes in hydrology began as early as 150 years ago, beginning with beaver and beaver dam removal, and continuing today with extensive irrigation withdrawals and channel alterations. Mean flow at the L5 gauge (RM 6) is 321 cfs based on 7 years of record. Historic flow, before irrigation, is unknown, however, there are approximately 73,266 acres of irrigated agricultural lands in the Lemhi River subbasin (IDWR 1999) which translates to a consumptive use of 106,236 acre feet (based on a consumptive use of 1.45 acre feet per acre per year [State of Idaho Civil Case # 4948]). This equates to 147 cfs evenly distributed over an entire year or 358 cfs over a 150 day irrigation season. Thus, the Lemhi River may have a mean flow of approximately 468 cfs without irrigation. All tributaries except Hayden Creek and Big Springs Creek are seasonally dewatered and surface flows no longer reach the mainstem Lemhi River during the irrigation season (April to October) (USDI-BLM 1999).

Historically, the entire Lemhi River contained good quality spawning and rearing habitat (McIntosh et al 1990). Changes in hydrology, sediment transport, and sedimentation have been so dramatic that the lower portion of the river is now generally suitable only for rearing and migration, however, Snake River steelhead attempted to construct redds between the L6 diversion and the mouth in spring 2002. It is not known if any of these redds were successful.

Currently, fish passage through the lower portion of the river is impaired by low flows and structures associated with irrigation diversions. In 2001, the Idaho Office of Species Conservation, Idaho Department of Water Resources, Idaho Department of Fish and Game, NOAA Fisheries, U.S. Fish and Wildlife Service, Lemhi Irrigation District, Water District 74, and the Upper Salmon Basin Watershed Project entered into an agreement (Lemhi Agreement) that among other things, provides stream flows for fish passage between the L6 diversion and the mouth of the Lemhi River. Water for stream flows is obtained through a combination of landowner agreements and annual water leases. The Lemhi Agreement also sets a schedule for development of a conservation plan in the Lemhi River subbasin that addresses instream flow and other components of resident and anadromous fish habitat.

Since the Lemhi Agreement has been in place, flows in the Lower Lemhi River have remained above 20 cfs, except for a brief time during spring 2002 when late snow melt prior to implementation of the water rentals made it impossible to meet all the early season irrigation demands and leave the agreed to flow in the river. During this time approximately 10 cfs was left in the Lemhi River at the L6 diversion.

In addition to the measures in the Lemhi Agreement, the BOR is pursuing several diversion improvements to comply with the 2000 FCRPS Opinion (NMFS 2000). Together, these activities should improve both upstream and downstream migration and rearing habitat in the lower 8.3 miles of the Lemhi River. In addition, the Upper Salmon River Watershed Project is actively working with landowners to improve riparian habitat on private land. A comprehensive listing of past and current restoration efforts in the Lemhi subbasin can be found in the 2002 Lemhi Agreement (IOSC et al 2002).

The portion of the Salmon River within the action area is used by anadromous fishes primarily for rearing and migration. All the anadromous fishes originating from the Upper Salmon Subbasins must migrate through the action area. Stock recruitment and smolt survival of Snake River spring/summer chinook salmon stocks in the Upper Salmon Subbasins is correlated with flow as measured at the Salmon River gauge near Salmon, Idaho (Appendix B). Surface water diversions affecting flows in the action area began in the mid 1800s and have increased since (State of Idaho Civil Case # 4948). There are approximately 91,839 acres of irrigated agricultural lands in the Upper Salmon Subbasins (IDWR 1999), which translates to a consumptive use of 133,166 acre feet per year (based on a consumptive use of 1.45 acre feet per acre per year [State of Idaho Civil Case # 4948]). This equates to 184 cfs evenly distributed over an entire year, or 447 cfs over a 150 day irrigation season. Mean flow at the Salmon River gauge is 1,946 cfs and the lowest flows during dry years are approximately 375 cfs. Without irrigation, minimum flow would be expected to be approximately 836 cfs. Minimum stream resource maintenance flow for the Salmon River in the action area, during the irrigation season, is 600 cfs (White and Cochnauer 1975).

4. Analysis of Effects of the Proposed Action

Effects of the action are defined as "the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with the action, that will be added to the environmental baseline" (50 CFR 402.02). Direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing essential elements of critical habitat. Indirect effects are defined in 50 CFR 402.02 as “those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.” They include the effects on listed species or critical habitat of future activities that are induced by the proposed action and that occur after the action is completed. “Interrelated actions are those that are part of a larger action and depend on the larger action for their justification” (50 CFR 403.02). “Interdependent actions are those that have no independent utility apart from the action under consideration” (50 CFR 402.02).

a. Effects of the Proposed Action

Step three of NOAA Fisheries jeopardy/adverse modification approach evaluates the effects of proposed actions on listed salmon and steelhead in the context of the status of the species and their habitats. To avoid jeopardy for listed salmon and steelhead and destruction/adverse modification of critical habitat for listed salmon, proposed actions generally must cause no more than minimal amounts of incidental take of the species, and also must restore, maintain, or at least not appreciably interfere with the recovery of the properly functioning condition (PFC) of the various fish habitat elements within a watershed. In reviewing the BA and accompanying narratives, NOAA Fisheries evaluates the elements of the proposed action that have the potential to affect the fish or essential elements of their habitat or critical habitat.

(1) Water Right Transfer and On Farm Improvements. Direct effects of the implementation of this project will include withdraw of an additional 13.5 cfs of water from the Salmon River at the S14 diversion and a reduction in withdraw of water from the Lemhi River at L6 of 13.5 cfs during the irrigation season. Proposed water withdraws will reduce flows in the Salmon River between the S14 diversion and the mouth of the Lemhi River, by 13.5 cfs. This represents approximately 3.65% of the minimum flow in the Salmon River during the irrigation season. Thirteen and one half cfs will be permanently applied to the instream flow water right between the L6 diversion and the mouth of the Lemhi River. Minimum flow in this reach of the Lemhi River (prior to implementation of the Lemhi Agreement) was less than 1 cfs, so an increase of 13.5 cfs is substantial. The water rights transferred to the Lemhi River will have the original priority dates of appropriation and will be left in the river as instream flow any time Water District 74 is in regulation.

The project will improve conveyance and irrigation efficiencies and may result in more water available for irrigation. This could result in the indirect effect of an increase in irrigated lands with the resultant increase in consumptive use and decrease in return groundwater flows. This would result in a net decrease in the amount of water available for instream flow downstream from the S14 diversion. This decrease would be substantially less than 13.5 cfs but the exact amount depends on future choices of participating irrigators.

A reduction in flow in the Salmon River could reduce survival of rearing and downstream migrating anadromous salmonids by increasing migration time, decreasing availability of cover, decreasing availability of forage, increasing susceptibility to predators, and contributing to water quality problems. There is a positive relationship between survival of downstream migrating juvenile Snake River spring/summer chinook salmon originating in the Upper Salmon Subbasins and Salmon River flow as measured at the gauge near Salmon, Idaho (Salmon gauge). Likewise, there is a positive relationship between survival of downstream migrating Snake River sockeye salmon and flows as measured at the Salmon gauge (Appendix B). The relationship is more pronounced for Snake River spring/summer chinook salmon, which can probably be explained by differences in life histories. Snake River sockeye salmon rear in lakes and migrate downstream in spring when flows are high and water temperatures are cool compared to summer and early fall. Snake River spring/summer chinook salmon begin moving downstream as early as the first summer after emergence and may rear anywhere between their spawning areas and the mouth of the Salmon River. Thus, Snake River chinook salmon are more susceptible to adverse effects from reduction in flow in the mainstem Salmon River than are Snake River sockeye salmon.

The project could also increase the chance of downstream migrating juvenile salmonids to be entrained in the S14 diversion. The diversion of an additional 13.5 cfs of water at S14 represents an increase in total volume of water diverted by 34%. Assuming the chance of downstream migrating juvenile salmonids entering a diversion is proportional to the amount of water diverted, this could impact juvenile salmonids originating from the Upper Salmon Subbasins by increasing their chances of entering the S14 diversion. Entering the S14 diversion could result in take by delaying migration or causing injury due to contact with the screen or bypass mechanisms, however, the S14 diversion is equipped with a fish screen and juvenile bypass system built to NOAA Fisheries standards which are generally effective in passing fishes the size of migrating juvenile anadromous salmonids in this reach of the Salmon River. Effects would be greatest on Snake River chinook salmon that often begin downstream movement during the summer or fall after emergence and at a relatively small size. Effects would probably be least on Snake River sockeye salmon that rear in lakes and migrate only after reaching smolt size. Snake River sockeye also migrate in spring when flows are relatively high and chance of entrainment in diversions is smallest.

The instream flow water right in the lower 8.3 miles of the Lemhi River will receive water from permanent senior water rights totaling 13.5 cfs to contribute to instream flow needs, thus increasing flows in the lower 8.3 miles of the Lemhi River by 13.5 cfs anytime Water District 74 is in regulation. There is a positive relationship between stock recruitment ratio of Snake River spring/summer chinook salmon in the Lemhi River and flows in the Lemhi River as measured at the gauge near Lemhi, Idaho (Lemhi gauge) (Appendix B). Based on this relationship, a flow increase of 13.5 cfs could be expected to increase stock recruitment ratios of Snake River spring/summer chinook salmon in the Lemhi River by as much as 20.8% (Appendix B) which should translate to a positive effect on population growth rate (lambda). However, the action will only affect flows below the L6 diversion and will not affect flows at the Lemhi gauge. The gauge in the affected reach (L5 gauge) has only been in place for 9 years and it is so severely imfluenced by the L6 and L7 diversions (70 cfs total water rights) that it is difficult to accurately predict effects of relatively small changes in flow, on the order of 5 to 15 cfs, with available data. Given that the reach between the L6 gauge and the mouth of the Lemhi River is the one most severely impacted by irrigation diversions, and given that there is a relationship between Lemhi River flows and performance of anadromous fish stocks, it is reasonable to assume that increasing flows through this reach will improve performance of Snake River spring/summer chinook salmon stocks in the Lemhi River. This improvement should be more than enough to offset adverse impacts on Snake River spring/summer chinook salmon due to the proposed increase in water diversion from the Salmon River and the possible increase in consumptive use.

Because Snake River sockeye salmon rear in lakes and migrate downstream in spring, adverse effects are likely to be negligible. Adverse effects on Snake River chinook salmon are likely to be more than negligible because they rear in the mainstem Salmon River and may migrate downstream any time of the year including late summer and early fall when impacts of water diversion are most pronounced. These impacts will be more than offset by increase in instream flows in the lower 8.3 miles of the Lemhi River. Not enough is known about relationship of Snake River steelhead and instream flow in the action area, however, their life history suggests that they are adversely impacted much the same as Snake River chinook salmon and likewise, will derive similar benefits. Snake River steelhead attempted to spawn in the Lemhi River within the action area in spring 2002. The proposed action could increase chance of future such attempts being successful.

(2) Repair of the S14 Diversion and Ditch. The proposed repair of the S14 diversion and ditch could adversely impact salmonid habitat by reducing riparian vegetation and increasing sediment and could disturb upstream or downstream migrating salmonids. This portion of the project will be completed between November 1 and December 31, when few migrating salmonids are present and when flows are relatively low, which should partially minimize adverse effects of the project. Adverse effects will be further minimized by implementation of the terms and conditions of the incidental take statement (Section II. B.).

b. Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." Other activities within the watershed have the potential to impact fish and habitat within the action area. Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, land management activities, and issuance of incidental take authorization under section 10(a)(1)(B), are being reviewed through separate section 7 consultation processes. Past Federal actions have already been added to the environmental baseline in the action area.

Land use activities and their effects, described in the baseline, are likely to continue. There is a trend toward fewer, larger, ranches and more single family residences, but the amount of irrigated agriculture appears to be relatively stable (Farm Census 1997). Otherwise, there are no anticipated cumulative effects.

5. Conclusion

The final step in NOAA Fisheries' approach to making a jeopardy/adverse modification determination is to determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of species survival in the wild or adversely modify critical habitat. NOAA Fisheries has determined that when the effects of the proposed action are added to the environmental baseline and cumulative effects occurring in the action area, the action is not likely to jeopardize the continued existence of the three listed ESUs considered in this Opinion. Further, NOAA Fisheries concludes that the proposed action would not cause adverse modification or destruction of designated critical habitat for Snake River spring/summer chinook or Snake River sockeye salmon.

These conclusions were based on the following considerations: (1) the reduction in flow in the Salmon River will be small compared to total flow in the Salmon River and most of the reduction will be confined to a six mile reach; (2) increase in the chance that downstream migrating juvenile salmonids will enter the S14 diversion is slight and the S14 diversion has a fish screen and juvenile bypass system constructed to NOAA Fisheries standards; (3) because they rear in lakes and migrate in spring when flows are high, adverse effects on Snake River sockeye salmon are expected to be negligible; (4) the action will contribute to improvement of Snake River spring/summer chinook salmon and Snake River steelhead fish passage and rearing habitat in the lower 8.3 miles of the Lemhi River resulting in increased production and population growth rate (lambda) that will offset adverse impacts on passage in the Salmon River; (5) adverse effects due to repair of the S14 diversion and ditch will affect only a short reach of the Salmon River at a time when few listed salmonids would be present. In reaching these determinations, NOAA Fisheries used the best scientific and commercial data available.

6. Conservation Recommendations

Conservation recommendations are defined as suggestions of NOAA Fisheries "regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information" (50 CFR 402.02). Section 7 (a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. NOAA Fisheries believes the conservation recommendations listed below are consistent with these obligations, and therefore should be implemented by the BPA.

1. The BPA should encourage other holders of senior water rights on the L6 diversion to participate in the project so the entire 13.5 cfs capacity of the project can be permanently applied to the instream flow water right on the Lemhi River.

7. Reinitiation of Consultation

This concludes formal consultation under the ESA on the L6 to S14 Diversion Transfer as outlined in the BA submitted on October 9, 2002. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) The amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

B. Incidental Take Statement

Sections 4 (d) and 9 of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Harm is further defined in 50 C.F.R. 222.102 as "an act that may include significant habitat modification or degradation where it actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns including breeding, spawning, rearing, migrating, feeding, or sheltering." Harass is defined as actions that create the likelihood of injuring listed species to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

1. Amount or Extent of Take

The proposed action is reasonably certain to result in incidental take of Snake River spring/summer chinook salmon and Snake River steelhead. NOAA Fisheries is reasonably certain the incidental take described here will occur because: (1) recent and historical surveys indicate the listed species are known to occur in the action area; and/or (2) the proposed action would adversely affect essential features of critical habitat that would in turn reduce the survival of the listed species for feeding, breeding, or sheltering. Despite the use of best scientific and commercial data available, NOAA Fisheries cannot quantify a specific amount of incidental take for individual fish for this action. Instead, the extent of take is anticipated to be minimal and is expected to be offset by improved passage and rearing conditions resulting from the project.

2. Reasonable and Prudent Measures

Reasonable and Prudent Measures are non-discretionary measures to minimize take, that are not already part of the description of the proposed action. They must be implemented as binding conditions for the exemption in section 7(a)(2) to apply. The BPA has the continuing duty to regulate the activities covered in this incidental take statement. If BPA fails to require the applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. NOAA Fisheries believes that activities carried out in a manner consistent with these reasonable and prudent measures, except those otherwise identified, will not necessitate further site-specific consultation. Activities which do not comply with all relevant reasonable and prudent measures will require further consultation.
NOAA Fisheries believes the following reasonable and prudent measures are necessary and appropriate to minimize take of listed fish resulting from implementation of the action. These

reasonable and prudent measures would also minimize adverse effects on designated critical habitat.

1. The BPA shall minimize chance of entrainment of downstream migrating anadromous salmonids in the S14 diversion.

2. The BPA shall minimize adverse effects of repairing the S14 diversion and ditch to the maximum extent practicable.

3. The BPA shall minimize adverse effects of dewatering irrigation ditches for construction.

4. The BPA shall monitor the possible indirect effects of increased consumptive use and overall depletion of water available for instream flows due to increased irrigation efficiency and conveyance efficiency resulting from this project.

3. <u>Terms and Conditions</u>

To be exempt from the prohibitions of section 9 of the ESA, BPA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity. These terms and conditions are non-discretionary.

1. To implement Reasonable and Prudent Measure #1, above, BPA shall ensure that the screen and juvenile bypass system on the S14 diversion are properly maintained.

2. To implement Reasonable and Prudent Measure #2 above, BPA shall ensure that the following measures are employed:

- Best Management Practices (BMPs) appropriate to the type of work being performed will be in place at all times when work is being performed. These may include, but are not limited to, straw bales and silt fences. A complete list of BMPs that may be appropriate for this project can be found in IDEQ (1997).

- Staging areas for vehicles and equipment will be at least 100 feet away from any waterway or wetland area. Where possible, a minimum buffer of 150 feet will be used.

- Heavy equipment left on-site will use drip pans as necessary to minimize soil contamination from leaks.

- Emergency spill containment equipment will be available at all times to manage petroleum product spills or leaks. If a spill or leak should occur, it will be managed and cleaned up immediately and the appropriate officials notified.

- No chemical dust suppressants will be used within 25 feet of any waterway. The use of water for dust suppression is preferred. Water will only be drawn from a site approved by NOAA Fisheries and/or FWS fisheries biologists. Water drawn from any location other than immediately below the fish screen will screen pumps to NOAA Fisheries criteria (see Appendix C).

- All fuel and petroleum products will be stored at least 100 feet from existing waterways and wetlands, if they are stored on site. Where possible, a minimum buffer of 150 feet will be used.

- Equipment used in the river will be inspected each day and whenever fueling takes place to ensure there are no leaks from hydraulic lines or other locations on the equipment. Equipment with leaks detected either during this inspection or during operations will not be used in or near the stream, until the leak is stopped and the area cleaned.

- Areas disturbed by construction will be replanted and/or reseeded by the beginning of the next growing season, or at the end of the project if there is sufficient growing time before onset of cold weather. Site reclamation will include replanting with native vegetation similar to what was removed during construction. Recommendations for types of plant species, timing of planting, and additional technical information are referenced in Natural Resource Conservation Service Technical Bulletins. Species that will not be used include Kentucky bluegrass and several species of crested wheatgrass.

- Only clean stone that is free of fine sediment will be used.

- The final design plan for replacement of riprap will be submitted to NOAA Fisheries and FWS at least 2 weeks prior to commencement of work.

3. To implement Reasonable and Prudent Measure #3, above, BPA shall coordinate with Idaho Department of Fish and Game (IDFG) screen shop prior to dewatering irrigation ditches for construction.

4. To implement Reasonable and Prudent Measure #3 above, BPA shall inventory lands irrigated with water transferred by this project at the time of completion and in subsequent years.

III. Magunson-Stevens Fishery Conservation and Management Act

A. Background

Public law 104-267, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Management and Conservation Act (MSA) to establish new requirements for EFH. The regulations require designation of EFH in Federal fishery management plans. The EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (MSA §3). The Pacific Fisheries Management Council has designated EFH for Federally managed Pacific groundfish and coastal pelagic and Pacific salmon fisheries. The EFH for the groundfish and coastal pelagic fisheries are marine designations, while the Pacific salmon EFH includes freshwater, marine, and estuarine environments.

The EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting, or funding activities that may adversely affect EFH, regardless of its location. The consultation requirements of section 305(b) of the MSA [16 U.S.C. 1855(b)] provide that:

1. Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH.

2. NOAA Fisheries shall provide conservation recommendations for any Federal or state activity that may adversely affect EFH.

Federal agencies shall, within 30 days after receiving conservation recommendations from NOAA Fisheries, provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reasons for not following the recommendations.

B. Pacific Coast Salmon and Essential Fish Habitat Affected by the Proposed Action

The Pacific Coast Salmon Fishery Management Plan (PFMP) was approved by the Secretary of Commerce on September 27, 2000. Pacific salmon species covered in the PFMP are coho salmon (*Oncorhynchus kisutch*), chinook salmon (*O. tshawytscha*), and pink salmon (*O. gorbuscha*). The PFMP designates EFH for the Pacific salmon fishery as all those streams, lakes, ponds, wetlands, and other waterbodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California, except above certain impassable barriers identified by PFMC, or above longstanding naturally impassable barriers (i.e., natural waterfalls in existence for several hundred years). Activities occurring above impassable barriers that are likely to adversely affect EFH are subject to the consultation provisions of the MSA.

The proposed action is within EFH for chinook salmon.

C. Summary of Proposed Actions

The proposed actions are described above (see *Description of the Proposed Action*, section I.B.).

D. Effects of the Proposed Action on EFH

1. General Considerations

This Opinion discusses in section II.A.3, *Analysis of Effects of Proposed Action,* the direct, indirect, and cumulative effects of the proposed action on anadromous fish habitat in the action area. The principal effects of the L6 to S14 Diversion Transfer salmon EFH are a decrease in flows in a six mile reach of the Salmon River and an increase in flows in a 8.3 mile reach of the Lemhi River.

2. Estuary and Nearshore EFH

Estuary and nearshore EFH is not affected by the proposed actions because they are several hundred miles inland, and relatively small in scope.

3. Coastal Pelagic EFH

Coastal pelagic EFH is not affected by the proposed action because the proposed action is several hundred miles inland, and relatively small in scope.

4. Salmon EFH

The BPA determined that the proposed action may adversely affect EFH for chinook salmon.

E. Conclusion

Based on the analysis in Section III.A.3, *Analysis of Effects of Proposed Action*, NOAA Fisheries believes that the proposed actions may adversely affect EFH for chinook salmon.

F. EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Act, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. In addition to conservation measures proposed for the project by the BPA, all of the reasonable and prudent measures and the terms and conditions contained in sections 2 and 3 of the incidental take statement of this Opinion are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of these measures here as EFH conservation recommendations.

G. Statutory Requirements

Please note that the Magnuson-Stevens Act (section 305(b)) and 50 CFR 600.920(j) requires the BPA to provide a written response to NOAA Fisheries' EFH conservation recommendations within 30 days of its receipt of this letter. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. If the response is inconsistent with NOAA Fisheries' conservation recommendatio0ns, the BPA shall explain its reasons for not following the recommendations.

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APPENDIX A

Chinook Salmon Redd Counts in Reaches Affected By the Transfer Project

Year	Redd Counts								
	Alturas Lake Creek	Lemhi River	Upper East Fork (spring)	Lower East Fork (summer)	Upper Salmon River	Lower Salmon River (summer)	Upper Valley Creek (spring)	Lower Valley Creek (summer)	Upper Yankee Fork
1957	110	719	61	656	1001	2533	219	331	47
1958	96	555	141	345	469	460	63	47	38
1959	18	468	75	240	486	352	23	70	10
1960	33	1262	122	403	579	811	87	137	43
1961	30	1720	618	559	723	356	227	158	192
1962	138	1309	334	195	638	467	157	115	60
1963	86	364	646	265	638	195	141	50	128
1964	80	1038	405	306	706	415	199	71	146
1965	101	433	138	131	472	201	204	57	77
1966	119	738	511	216	581	390	219	184	112
1967	74	786	614	234	943	365	253	79	250
1968	110	572	622	235	637	223	330	63	234
1969	41	328	174	138	313	120	35	22	53
1970	68	344	468	123	432	150	202	41	67
1971	50	392	370	149	619	220	89	147	57
1972	143	473	448	161	748	412	182	39	115
1973	153	433	665	138	411	224	125	77	104

Year	Redd Counts								
	Alturas Lake Creek	Lemhi River	Upper East Fork (spring)	Lower East Fork (summer)	Upper Salmon River	Lower Salmon River (summer)	Upper Valley Creek (spring)	Lower Valley Creek (summer)	Upper Yankee Fork
1974	42	237	346	49	338	40	127	45	54
1975	60	365	348	38	509	45	198	80	60
1976	16	227	75	39	378	44	NC	43	40
1977	85	443	168	136	698	94	18	63	6
1978	303	703	841	NC	1707	359	141	219	33
1979	29	146	57	33	205	NC	25	15	18
1980	7	25	6	0	47	11	6	4	0
1981	4	115	76	43	404	75	2	17	4
1982	9	149	28	19	42	39	1	8	0
1983	27	46	122	27	161	111	8	28	0
1984	3	35	NC	7	71	51	6	15	NC
1985	7	93	NC	9	120	82	1	1	5
1986	14	157	NC	41	134	104	13	16	15
1987	9	155	NC	62	162	200	31	59	0
1988	1	179	NC	85	146	150	12	33	1
1989	7	32	NC	51	102	77	23	26	7
1990	0	80	NC	19	97	52	3	9	3
1991	3	55	21	23	83	68	2	3	0

Year	Redd Counts								
	Alturas Lake Creek	Lemhi River	Upper East Fork (spring)	Lower East Fork (summer)	Upper Salmon River	Lower Salmon River (summer)	Upper Valley Creek (spring)	Lower Valley Creek (summer)	Upper Yankee Fork
1992	2	15	10	16	51	26	1	6	1
1993	6	23	21	41	65	48	7	16	0
1994	0	7	3	5	21	9	0	9	0
1995	0	5	1	4	5	NC	0	0	0
1996	1	29	5	5	19	16	2	1	0
1997	0	50	3	5	26	48	4	8	0
1998	0	40	33	19	47	29	28	9	4
1999	1	35	23	7	25	23	4	3	0
2000	8	85	27	32	149	80	2	3	6
2001	18	316	60	76	357	120	26	39	14

APPENDIX B

Introduction

Information in this appendix is provided to document the relationships between flow and performance of anadromous fish stocks in the Lemhi subbasin and the Upper Salmon Subbasins.

Methods and Data Sources

The following public sources of data were analyzed. Longstanding spawning surveys (redd counts) for Lemhi River (Lemhi subbasin) and upper Salmon River (Upper Salmon Subbasins) index areas were retrieved from www.streamnet.org. Updated and corrected redd counts (1995 to 2001) for recent years were provided for Lemhi subbasin and the Upper Salmon Subbasins by Idaho Department of Fish and Game. Monthly streamflow data from longstanding gages were retrieved from www.water.usgs.gov. Tagging and detection data for migrating salmon were retrieved from the PIT-Tag Information System (PTAGIS) maintained by the Pacific States Marine Fisheries Commission (www.psmfc.org/pittag).

Stock-recruitment ratios were calculated using stock-recruit curves (recruits/parents) on a four-year generation. A brood year model was developed, following logic from the scientific literature that shows greatest mortality rates for salmonids occur during early life while in freshwater habitats (Thompson 1959; Waters 1995; Bjornn and Reiser 1991). The model aligns each year of redds with a two-year average of August flows from 3 and 4 years previous.

Migration survival was estimated using uncorrected recapture rates of PIT-Tagged smolts as a surrogate for survival. Smolts were tagged at upriver stations and released to continue migration. Recapture was defined as detection at a downstream PIT tag interrogation site and the proportion of tagged fish detected was used as a surrogate for survival rate. All data were examined for erroneous records and other inconsistencies. Peak runoff during spring 1997 was too high at most chinook trapping stations to efficiently trap (and tag) migrating wild smolts, so that year was excluded from the
1993 to 2001 data set. Monthly records with fewer than five fish tagged were excluded. Stations with incomplete records by year (n less than 8), such as East Fork Salmon and West Fork Yankee Fork rivers were reviewed for consistency in trends and results, but were excluded from inferential tests.

Results and Discussion

Migration Survival to Flow Relationship

Figure 1 shows the relations between Salmon River flow, as measured at the Salmon gauge, and survival rate (proportion of fish known to survive to a PIT tag interrogation facility in the FCRPS) of Snake River spring/summer chinook smolts from the Upper Salmon Subbasins. Figure 2 shows the relation between survival rate of sockeye salmon smolts with Salmon River flow, as measured at the Salmon gauge. Both Figures 1 and 2 show that flow (below approximately 5,000 cubic feed per second [cfs]) in the Salmon River is positively correlated with survival of smolts migrating between PIT tagging stations and PIT tag interrogation facilities in the Federal Columbia River Power System (FCRPS).

Figure 3 shows the relation between Lemhi River flow as measured at the Lemhi gauge and survival rate of Snake River spring/summer chinook smolts from the Lemhi River. Figure 3 shows that flow (below approximately 550 cfs) in the Lemhi River is positively correlated with survival of smolts migrating between the Lemhi River PIT tagging station and the FCRPS.

These analyses assume that chance of a PIT tagged fish being detected while migrating past PIT tag interrogation sites is not related to flow. In reality, PIT tagged fishes are more likely to be detected while migrating past an interrogation site during low flows than during high flows. So the analyses very likely underestimate the effect of flows on survival of migrating fishes.

At low stock abundance, the survival rate of a single life-stage can set or regulate the production of the entire stock (NMFS 2000). Thus, reduced survival of migrating smolts at lower flows could translate to a reduced number of recruits to succeeding life stages.

Production and Recruitment to Flow Relationship

Figure 4 and Figure 5 show relationships between chinook salmon redds and August flows measured 3 - 4 years prior when spawners were juveniles rearing in the upper Salmon River and Lemhi River, respectively. Again, there is a significant correlation between recruitment and flow during early life, which apparently affects the overall productivity of the stocks.

Conclusion

Overall performance of Snake River spring/summer chinook salmon stocks in the Lemhi subbasin and in the Upper Salmon Subbasins is correlated with Lemhi River flow as measured at the Lemhi gauge and with Salmon River flow as measured at the Salmon gauge, respectively. One of the causative mechanisms appears to be juvenile survival during downstream migration which is also correlated with flow. Salmon River flows are substantially depleted during the irrigation season, which given the relationships between flow and performance of the stocks, could adversely impact Snake River spring/summer chinook salmon stocks.

Survival of Snake River sockeye salmon is also correlated with Salmon River flows as measured at the Salmon gauge.

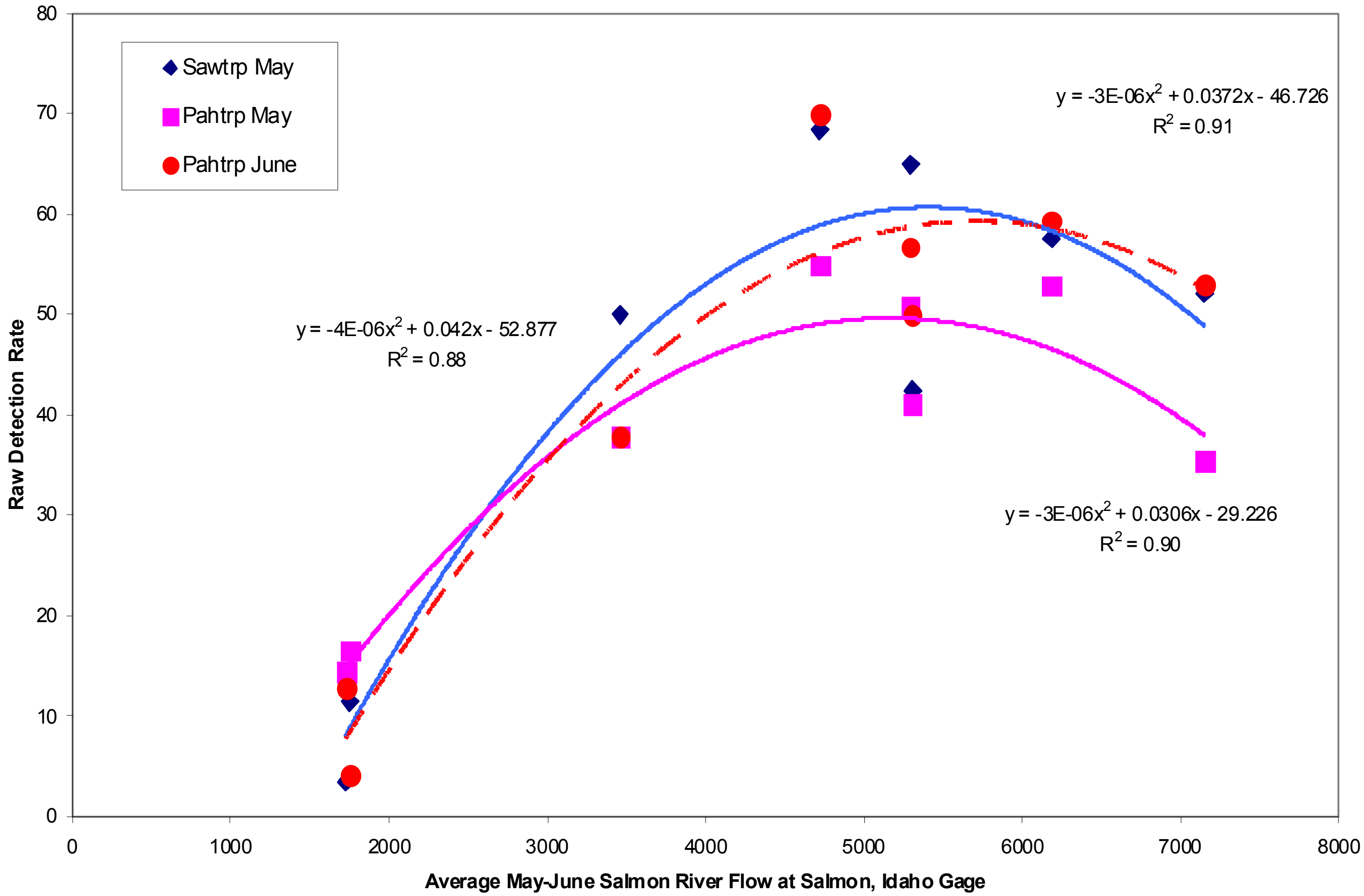

Figure 1. Survival (detection in the FCRPS) of wild spring-summer chinook smolts from the Upper Salmon Subbasins versus Salmon River flows gaged at Salmon, Idaho. Smolts were tagged at Sawtooth and Pahsimeroi traps from May-June. The slope of each regression is significantly different from zero ($P < 0.05$).

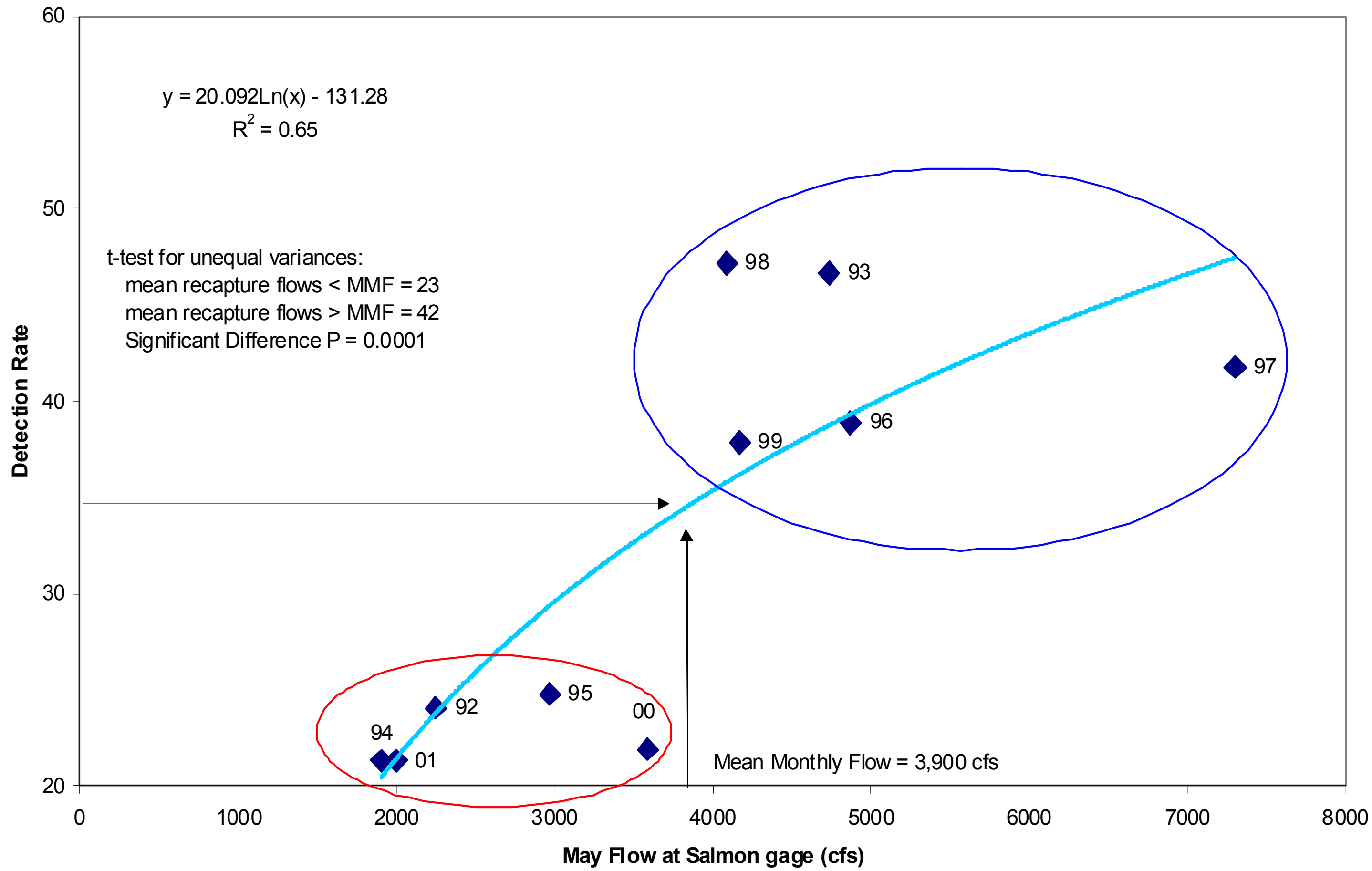

Figure 2. Survival (detection in the FCRPS) of endangered sockeye salmon smolts migrating from the Stanley Basin to the FCRPS (466 miles or more downstream) versus May flow in the upper Salmon mainstem measured at Salmon, Idaho gage (1992-2001). About 80% of sockeye smolts migrate through the Salmon River during May.

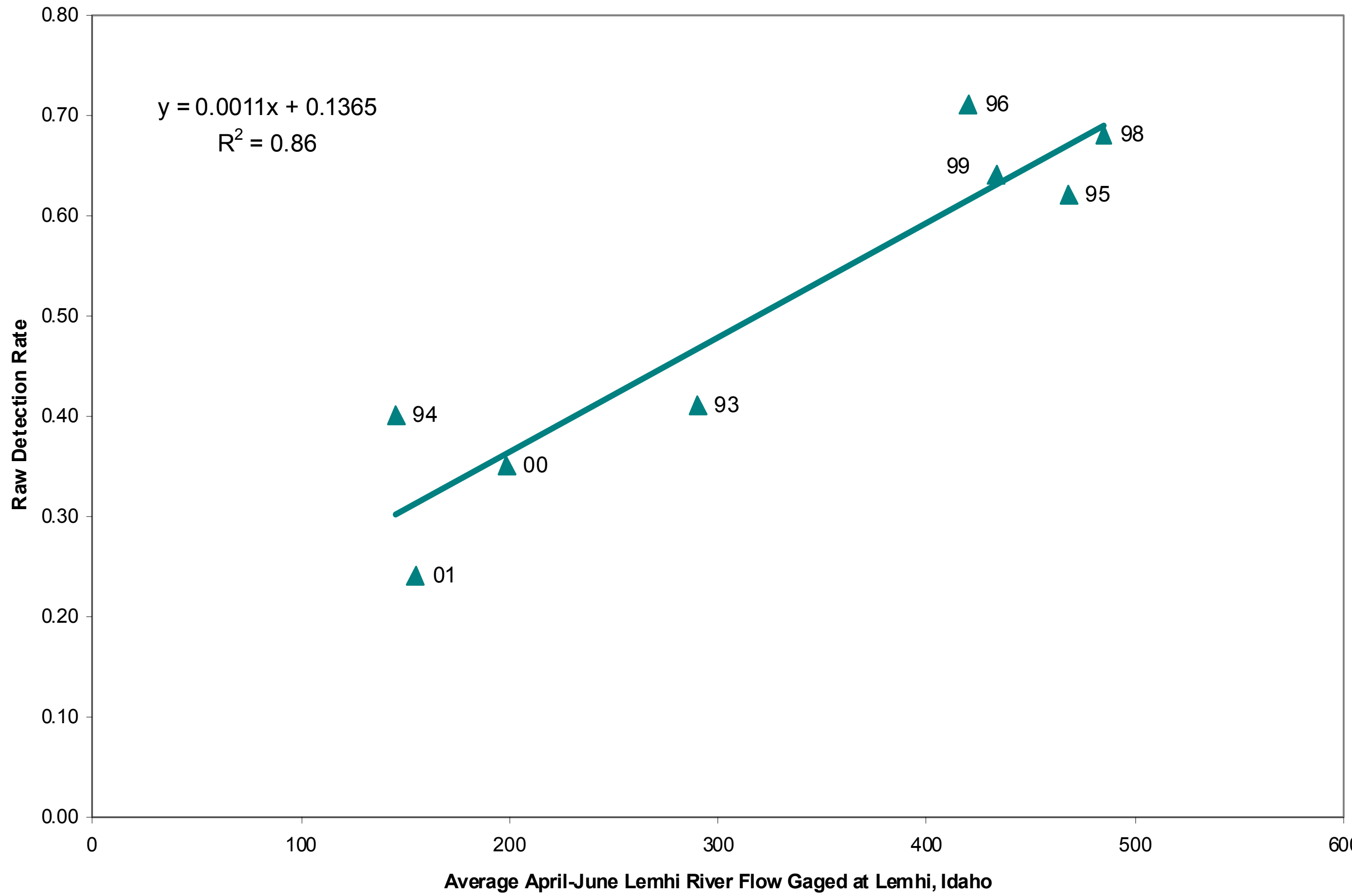

Figure 3. Survival (detection in the FCRPS) of wild spring-summer chinook smolts in the Lemhi River verses Lemhi River flows gauged at Lemhi, Idaho. Smolts were tagged at the Lemhi trap in April-June. The slope of the regression is significantly different from zero ($P < 0.05$).

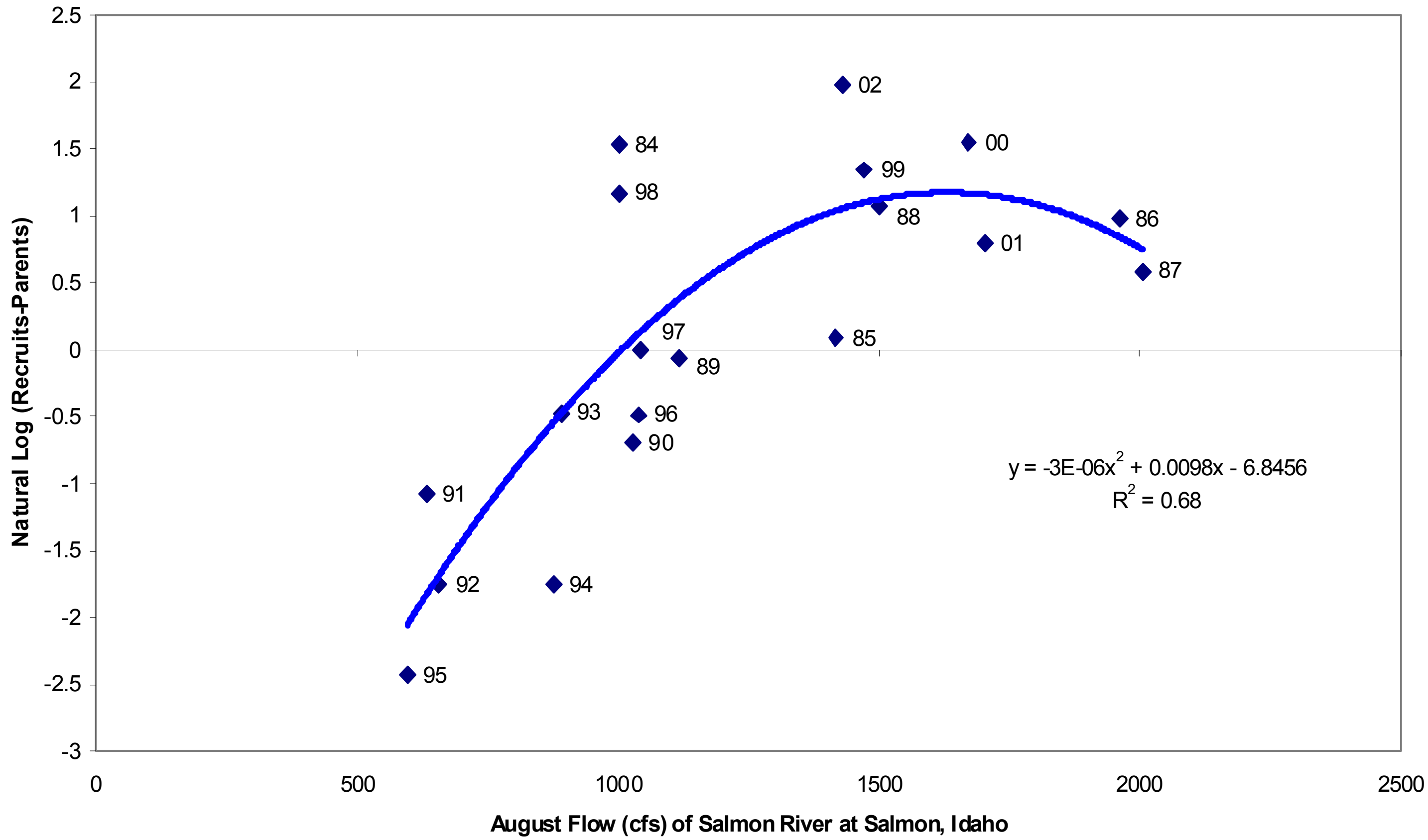

Figure 4. Stock-recruitment of spring/summer chinook in the upper Salmon Subbasins from 1984-2002 compared with August flows gaged at Salmon, Idaho. The horizontal line at zero is the stock replacement line with positive recruitment at higher flows. August flows are running two-year averages from 3-4 years prior to spawning, and thus represent flow conditions juveniles were exposed to during their first two years of life. Data labels indicate spawning year of recruits.

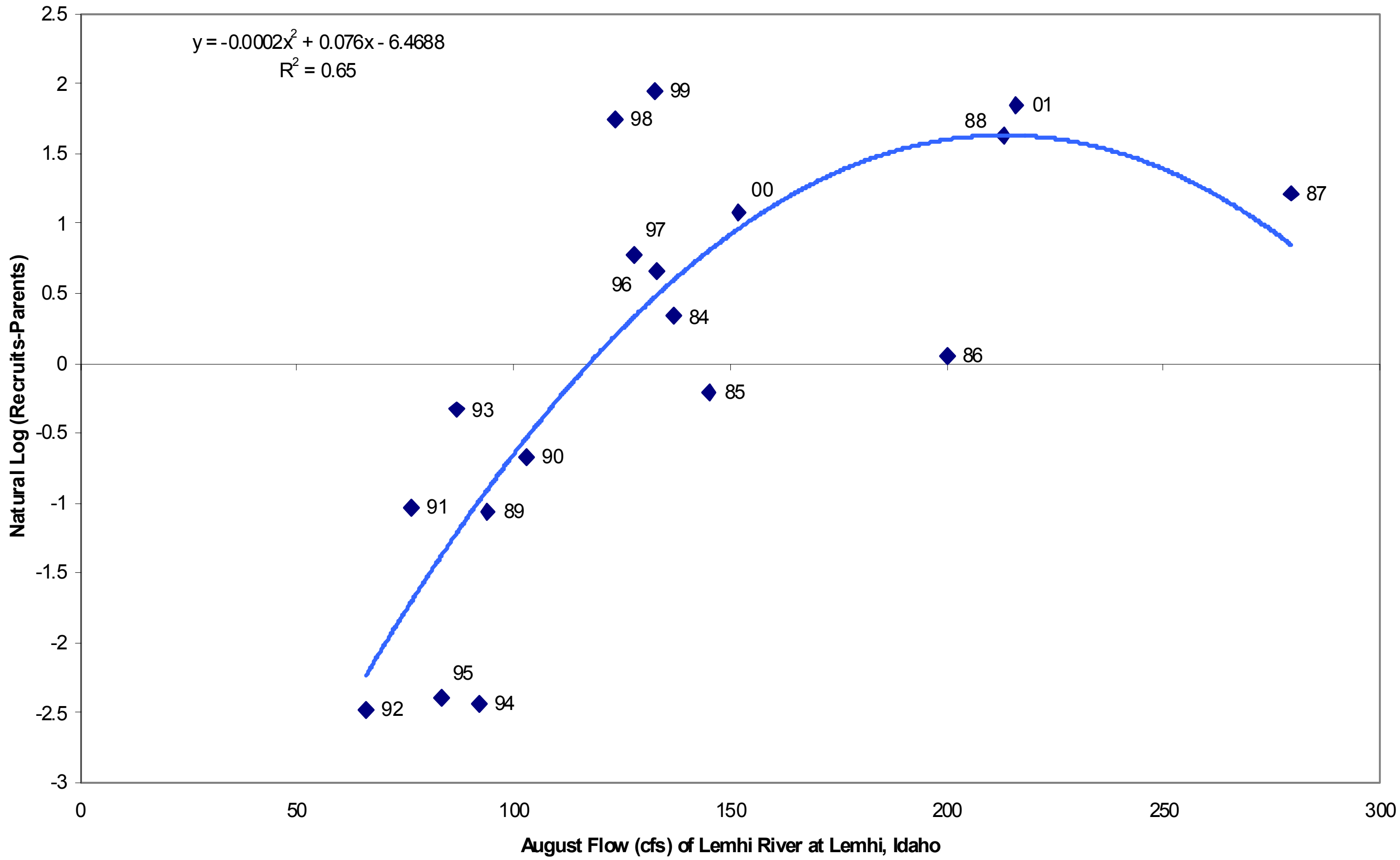

Figure 5. Stock-recruitment of Lemhi spring/summer chinook in the Lemhi River compared with August flows gauged at Lemhi, Idaho. The horizontal line at zero is the stock replacement line with positive recruitment at higher flows. August flows are running two-year averages from 3-4 years prior to spawning, and thus represent flow conditions juveniles were exposed to during their first two years of life. Data labels indicate spawning year of recruits.

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APPENDIX C

NOAA Fisheries Juvenile Fish Screen Criteria Screening Pump Intakes

ADDENDUM

JUVENILE FISH SCREEN CRITERIA FOR PUMP INTAKES
Developed by
National Marine Fisheries Service
Environmental & Technical Services Division
Portland, Oregon
May 9, 1996

The following criteria serve as an addendum to current National Marine Fisheries Service gravity intake juvenile fish screen criteria. These criteria apply to new pump intake screens and existing inadequate pump intake screens, as determined by fisheries agencies with project jurisdiction.

Definitions used in pump intake screen criteria Pump intake screens are defined as screening devices attached directly to a pressurized diversion intake pipe. Effective screen area is calculated by subtracting screen area occluded by structural members from the total screen area. Screen mesh opening is the narrowest opening in screen mesh. Approach velocity is the calculated velocity component perpendicular to the screen face. Sweeping velocity is the flow velocity component parallel to the screen face with the pump turned off.

Active pump intake screens are equipped with a cleaning system with proven cleaning capability, and are cleaned as frequently as necessary to keep the screens clean. Passive pump intake screens have no cleaning system and should only be used when the debris load is expected to be low, and 1) if a small screen (less than 1 CFS pump) is over-sized to eliminate debris impingement, and 2) where sufficient sweeping velocity exists to eliminate debris build-up on the screen surface, and 3) if the maximum diverted flow is less than .01% of the total minimum streamflow, or 4) the intake is deep in a reservoir, away from the shoreline.

Pump Intake Screen Flow Criteria

The minimum effective screen area in square feet for an active pump intake screen is calculated by dividing the maximum flow rate in cubic feet per second (CFS) by an approach velocity of 0.4 feet per second (FPS). The minimum effective screen area in square feet for a passive pump intake screen is calculated by dividing the maximum flow rate in CFS by an approach velocity of 0.2 FPS. Certain site conditions may allow for a waiver of the 0.2 FPS approach velocity criteria and allow a passive screen to be installed using 0.4 FPS as design criteria. These cases will be considered on a site-by-site basis by the fisheries agencies.

If fry-sized salmonids (i.e. less than 60 millimeter fork length) are not ever present at the site and larger juvenile salmonids are present (as determined by agency biologists), approach velocity shall not exceed 0.8 FPS for active pump intake screens, or 0.4 FPS for passive pump intake screens. The allowable flow should be distributed to achieve uniform approach velocity (plus or minus 10%) over the entire screen area. Additional screen area or flow baffling may be required to account for designs with non-uniform approach velocity.

Pump Intake Screen Mesh Material

Screen mesh openings shall not exceed 3/32 inch (2.38 mm) for woven wire or perforated plate screens, or 0.0689 inch (1.75 mm) for profile wire screens, with a minimum 27% open area. If fry-sized salmonids are never present at the site (by determination of agency biologists) screen mesh openings shall not exceed 1/4 inch (6.35 mm) for woven wire, perforated plate screens, or profile wire screens, with a minimum of 40% open area.

Screen mesh material and support structure shall work in tandem to be sufficiently durable to withstand the rigors of the installation site. No gaps greater than 3/32 inch shall exist in any type screen mesh or at points of mesh attachment. Special mesh materials that inhibit aquatic growth may be required at some sites.

Pump Intake Screen Location

When possible, pump intake screens shall be placed in locations with sufficient sweeping velocity to sweep away debris removed from the screen face. Pump intake screens shall be submerged to a depth of at least one screen radius below the minimum water surface, with a minimum of one screen radius clearance between screen surfaces and adjacent natural or constructed features. A clear escape route should exist for fish that approach the intake volitionally or otherwise. For example, if a pump intake is located off of the river (such as in an intake lagoon), a conventional open channel screen should be considered, placed in the channel or at the edge of the river. Intakes in reservoirs should be as deep as practical, to reduce the numbers of juvenile salmonids that approach the intake. Adverse alterations to riverine habitat shall be minimized.

Pump Intake Screen Protection

Pump intake screens shall be protected from heavy debris, icing and other conditions that may compromise screen integrity. Protection can be provided by using log booms, trash racks or mechanisms for removing the intake from the river during adverse conditions. An inspection and maintenance plan for the pump intake screen is required, to ensure that the screen is operating as designed per these criteria.